Decline of pesticide use in martinique: towards "zero pesticide" in intensive banana cropping systems

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Context

In Martinique (French West Indies), bananas and sugarcane are the main cultivated crops. Until the middle of the 90's, the traditional banana cropping systems were based on monoculture with the systematic use of pesticides to control diseases and pests (sigatoka, nematodes, weevils and weeds).

Materials and methods

To evaluate the use of pesticides in banana cultivation, exhaustive surveys have been realized with distributors of pesticides, growers and official custom services. These surveys were repeated annually from 1996 to 2009.

Results

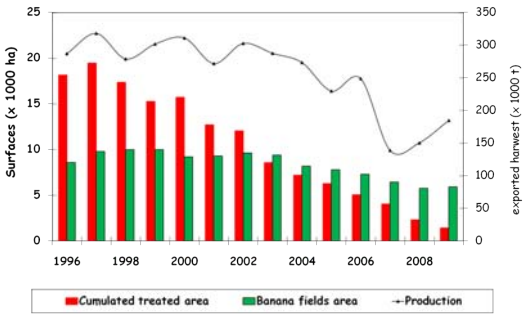
In 1996, 56 % of the pesticides used on banana fields belonged to the nematicide category which primarily targeted nematodes, especially the burrowing nematode *Radopholus similis*, but also the black weevil *Cosmopolites sordidus*. From 1996 to 2009, the use of nematicides and insecticides has declined sharply from 84.4 to 6.6 tons of active ingredients in Martinique. However, as the surface of banana fields also diminished from 8,600 to 5,900 ha, the relative consumption per ha regressed from 9.82 to 1.12 kg/ha/year. This dramatic regression is mainly the result of:

1. the development of cultural systems based on the sanitation of fields by fallows or crop rotations combined with the use of nematode-free vitro-plants ; these systems are improved using cultural techniques such as ditches to prevent nematode contamination through runoff water;
2. completed by the generalization of pheromone mass-trapping against the black weevil *C. sordidus*.

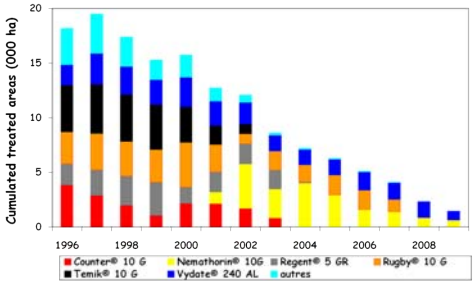
New researches associating researchers, producers of the FWI (UGPBAN) consist on i) using natural and introduced biodiversity and ii) selecting new tolerant varieties may complete this evolution toward "zero pesticide". Thereby, cover crops and sigatoka resistant varieties should also decrease also the needs for herbicides and fungicides.

1- *Radopholus similis* (Cobb) x 100

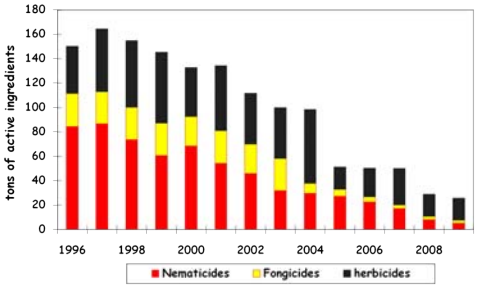
2- *Cosmopolites sordidus* (Germar)



3- Evolution of areas treated with nematicides in Martinique from 1996 to 2009



4- Evolution of utilization of the various products from 1996 to 2009 in Martinique
(in area treated = commercialized product / homologated dose)



5- Evolution of utilization of the various pesticide groups in Martinican banana fields

6- Ditches can efficiently prevent *R. similis* dissemination by runof water.

7-Trials with cover plants (Stylosanthes guianensis) in a banana field.

8- Pheromone traps *vs. Cosmopolites sordidus*